

Case Study: Hot Spring Swimming Pool Ozonation

“Ozonation of Glenwood Spring Colorado, has been yielding good results since 1991. It replaced dechlorination system and adopted much more simpler and cost effective system. It has been in operation from the last 15 years. Water quality has improved and the algae control has been excellent”.

Hot Springs Pool and Lodge Resort installed ozonation system in order to treat world's largest hot springs-fed swimming pool. The installation of ozone system was necessary because there was difficulty in supplying gaseous chlorine in this area. Moreover storage of chlorine was also a problem. The use of chlorine was also causing some skin problems. Due to these factors it was decided to use an alternative method to treat swimming pool water.

The resort has two open pools fed from a mountain hot spring. As the source of water is underground hot water spring hence, it consist of large amount of elements like iron, manganese, algae spores, dissolved organics, and hydrogen sulfide contaminate the raw waters. These contaminants can be treated easily using ozone. It was expected that ozonation will result in following:

- Disinfection from bacteria
- Inactivation from virus
- Algae control

Prior to ozonation, water from the balance tank is treated with circa 1 mg/l of polyaluminum chloride (PACl) flocculant. Ozone dosage at maximum loading is 1,200 g/h, reacted over a minimum two minutes retention time in a 9,000-gallon reactor. Using a turbine pump, a venturi injector, and a static mixer contacting device ozone is injected. Ozonation process is monitored and controlled by ORP readings taken at the reactor effluent. With the help of ORP pH is controlled and adjusted.

After treatment with the ozone, water is passed through a gravity filter the bottom part which consists of sand and gravel. The residual chlorine level is adjusted by using sodium hypochlorite.